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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/508,819	02/22/2005	Wolfgang Erbkamm	36381 PCT USA	6210
21003	7590	04/09/2008	EXAMINER	
BAKER BOTTS L.L.P.			BERMAN, JASON	
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NEW YORK, NY 10112-4498				
			ART UNIT	PAPER NUMBER
			4132	
			NOTIFICATION DATE	DELIVERY MODE
			04/09/2008	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DLNYDOCKET@BAKERBOTTS.COM

<b>Office Action Summary</b>	<b>Application No.</b> 10/508,819	<b>Applicant(s)</b> ERBKAMM ET AL.	
	<b>Examiner</b> Jason M. Berman	<b>Art Unit</b> 4132	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11/3/04, preliminary amendment.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 8-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/31/05</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 9 is objected to because of the following informalities: The claim recites the angles between corners of adjacent target plates and the angle between the maxima of the magnetic flux lines as both being “angle  $\gamma$ ”. Applicant likely meant to indicate the angle between target plate corners as “angle  $\alpha$ ”, and the angle between the magnetic maxima as “angle  $\beta$ .” Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 8-11 are rejected under 35 U.S.C. 102(b) as being anticipated by McKelvey (US 4,443,318, as cited in the IDS).

As to claim 8, McKelvey discloses a tube magnetron comprising:

- A hollow rotating tube target arrangement of longitudinally extended target plates that are fixed to a target support (Abstract: a rotatable magnetron cathode; Fig 3: showing a hollow tube arrangement of the rotatable targets (31) attached to a target support (21));

- Wherein the target plates in cross section are arranged adjacent to each other to form a polygon (Fig 3: showing the targets arranged in a polygon shape: hexagonal);
- A magnet system, wherein the magnet system provides a magnetic field passing through the tube target arrangement (Fig 3: showing U-shaped magnets (45), inherently having a magnetic field which passes through targets (31)); and
- Wherein the magnetic field has in cross section two maxima arranged in the axial longitudinal direction of the tube target arrangement and in the interior thereof (Fig 3: showing two U-shaped magnets (45) arranged with opposing poles 47 (north) and 49 (south) form three pole points, inherently creating two arc-like magnetic fields between the outer north poles and inner south pole, having two maxima);

As to claim 9, McKelvey discloses the width and number of target plates selected so that an angle  $\alpha$  is related to an angle  $\beta$  as  $\beta = (n + 0.5)\alpha$ , wherein  $n$  is selected to be an integer (Fig 3: showing an angle between edges of each target as  $30^\circ$ , and the angle between the maxima (not explicitly shown) of the formed magnetic fields as approximately  $45^\circ$ , giving a value for  $n$  of 1).

As to claim 10, McKelvey discloses  $n$  selected to be 1 so that  $\beta = 1.5\alpha$  (Fig 3: showing an angle between edges of each target as  $30^\circ$ , and the angle

between the maxima (not explicitly shown) of the formed magnetic fields as approximately 45°, giving a value for n of 1).

As to claim 11, McKelvey discloses the target plates being bonded to the target support (col 2 lines 58-61: the target strips are secured to tubular member by clamping bars).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 12 -13 are rejected under 35 U.S.C. 103(a) as being unpatentable over McKelvey, as applied to claim 8 above, and further in view of Serole (FR 2745010 A1, cited in the IDS, refer to translation).

As to claim 12, McKelvey is silent as to the target plate comprising a target material of ceramic or high melting-point materials.

Serole discloses the use of a tube shaped target in a magnetron sputtering device (Page 1 Paragraph 3 – disclosing magnetron process, Paragraph 8- use of a tube shaped cathode). Serole also discloses that the disclosed invention uses targets of ceramics and high melting point materials (Page 2 Paragraph 14: targets of ceramic material or tungsten (a high melting point material)). Serole discloses that these materials are not easily formed into actual tubes and are more easily and cheaply used as plates arranged in a tubular form (Page 2, Paragraph 14).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine targets made of ceramic or high melting point material, as disclosed by Serole, with a rotatable tubular sputtering apparatus, as disclosed by McKelvey, in order to avoid the high price and difficult processing of ceramic and high melting-point materials into suitable target form.

As to claim 13, Serole discloses the target material comprising ITO or silicon (Page 2 paragraph 14).

6. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over McKelvey in view of Toyama (US 6,475,354).

As to claim 14, McKelvey is silent as to the target rotation speed.

Toyama discloses a magnetron sputtering process using a tube shaped target (Figure 1 showing tube shaped sputtering target 5 with magnet 7). Toyama also discloses the target rotating at a speed of 1 revolution per second to 2 revolutions per

minute (col 5 lines 57-67: use ITO tube shaped target rotating at 3 rpm). Toyama discloses the use of this procedure as producing ITO films with good reproducibility (col 6 lines 43-44).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine a sputtering procedure with a rotation speed between 1 revolution per second and 2 revolutions per minute, as disclosed by Toyama, with a tube-shaped target magnetron sputtering apparatus, as disclosed by McKelvey, in order to obtain a film with good reproducibility.

As to claim 15, McKelvey discloses a tube magnetron for sputtering of target material by a plasma on application of a voltage, comprising:

- A hollow rotating tube target arrangement of longitudinally extended target plates that are fixed to a target support (Abstract: a rotatable magnetron cathode; Fig 3: showing a hollow tube arrangement of the rotatable targets (31) attached to a target support (21));
- A magnet system configured to provide a magnetic field passing through the tube target arrangement (Fig 3: showing U-shaped magnets (45), inherently having a magnetic field which passes through targets (31));
- Wherein the target plates in cross section are arranged adjacent to each other to form a polygon (Fig 3: showing the targets arranged in a polygon shape: hexagonal);
- Wherein the magnetic field has in cross section two maxima arranged in the axial longitudinal direction of the tube target arrangement (Fig 3:

showing two U-shaped magnets (45) arranged with opposing poles 47 (north) and 49 (south) form three pole points, inherently creating two arc-like magnetic fields between the outer north poles and inner south pole, having two maxima);

McKelvey is silent as to the equalization of plasma fluctuations effected by a plasma emission monitor control.

Toyama discloses a magnetron sputtering process using a tube shaped target (Figure 1 showing tube shaped sputtering target 5 with magnet 7). Toyama also discloses the use of a plasma emission monitor control (col 3, lines 24-26: collimator is where the plasma emission intensity is measured) which operates to equalize the sputter rate fluctuations (col 4 lines 17-20: set value of emission intensity of the plasma is adjusted so that the deposition rate can be controlled). This system is disclosed as allowing for a constant deposition rate (Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine a plasma emission monitor control to equalize the sputter rate, as disclosed by Toyama, with a tube magnetron sputtering apparatus, as disclosed by McKelvey, in order to obtain a constant sputtering rate.

#### ***Correspondence Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Berman whose telephone number is (571)270-5265. The examiner can normally be reached on M-R 8am-5pm EST.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on (571)272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. M. B./  
Examiner, Art Unit 4132

/Jessica L. Ward/  
Supervisory Patent Examiner, Art Unit 4132